

10-26-59

PRELIMINARY REPORT OF FOREST INSECT CONDITIONS IN
CALIFORNIA - 1959

With the exception of the North Coast subregion, there has been a marked upswing in insect activity over most of the State. Most of the increase has been due to the activities of the mountain pine beetle, particularly in sugar pine and, to a lesser degree, in lodgepole pine; the California five-spined engraver alone and in combination with the western pine beetle in ponderosa and Coulter pine; the western pine beetle in ponderosa and Coulter pine; the Jeffrey pine beetle in Jeffrey pine; and the fir engraver in white and red fir; and the Douglas-fir engraver in Douglas-fir.

The forest insect situation for the coming winter looks very grave at the present. We have experienced a very dry, warm fall to date which has greatly extended the period of normal bark beetle activity. Because of the prolonged drought period, the trees are probably in a highly susceptible condition for beetle attack. We suspect that there are numerous green infested trees in the woods which have not yet been detected. All woods workers should be particularly alert to detect any increased insect activity in their particular areas. And in view of the outlook for increased damage, steps to prevent the damage should be taken where possible.

There is continued emphasis by industry and the Federal government to control bark beetles through the salvage of infested trees in commercial timber-producing areas in northern California.

The California Cooperative Forest Pest Detection Survey program continues to function very well in terms of the number of detection reports received. However, there are still some weak spots in the program where some cooperators fail to send in reports of significant outbreaks in local areas. A total of 508 detection reports have been received to date of which 407 have covered insect damage, 90 diseases, and 11 animal damage. This compares with a total of 286 received one year ago. This represents an increase of 222 or 78 percent.

In order to better delineate the extent of the infestations the Experiment Station conducted a limited aerial survey during the period of October 12 to 16, in areas where ground detection reports or observations by the Station survey staff had indicated evidence of serious outbreaks developing.

This report is a digest of all available information from cooperators from State, private and federal agencies, together with observations from our Station survey staff both from the ground and from the air. The conditions reported are those prevailing on October 15 and may be conservative for the total loss for 1959.

A brief summary follows for the various insects reported or observed.

1. Activity of the mountain pine beetle in sugar and ponderosa pine is greatly accelerated in 1959 over that for the past several years, with increases noted also in lodgepole pine.

2. The western pine beetle in ponderosa and Coulter pine is in outbreak proportions over much of the State, with very definite increases in comparison to 1958.

3. Pine engraver beetle damage has greatly increased statewide except for the North Coast, and 1959 may represent a peak year of loss.

4. Damage by the fir engraver in white and red fir was spotty with some areas of very heavy loss.

5. The Jeffrey pine beetle shows some sign of increased activity over much of the State.

6. The lodgepole needleminer in lodgepole pine continues in outbreak proportions in Yosemite and Sequoia-Kings Canyon National Parks and in a local area on the Inyo National Forest. The work of this insect was reported but not definitely confirmed on the Sierra National Forest.

7. The Douglas-fir engraver is in outbreak proportions in many areas in the North Coast subregion.

8. The Douglas-fir beetle is at a low level except in a few local areas in the North Coast and one locality in the Central Sierras.

9. The status of the California flatheaded borer in southern California remains at a moderate level, about the same as for last year.

10. Several new localities of local outbreaks of the black pine-leaf scale were reported on sugar pine.

11. Tip-killing in mature ponderosa and sugar pine was considerably reduced but increased in Coulter pine.

12. Damage by woolly aphids to various pine and fir species increased in 1959.

13. Numerous reports were received early this year of the abundance of larvae of the silver-spotted tiger moth, but little evidence of defoliation was noted.

14. The Douglas-fir tussock moth remained at a very low level for the third straight year following a control program.

15. Defoliation of browse species by the Great Basin tent caterpillar was somewhat reduced over the high level of last year.

16. Defoliation of white fir by the spruce budworm increased markedly in the North and South Warner Mountains.

17. Large numbers of adult pandora moths were observed in two local areas in southern California, but no defoliation was noted.

18. Sawfly damage in both pine and fir showed some reduction.

19. The tortoise shell butterfly caused heavy defoliation on browse species in the North Coast area.

20. Seed and cone insects remain at a high level with heavy damage to a light cone and seed crop.

21. The gouty pitch midge showed little change from moderate damage in 1958 except for one local outbreak on the Lassen National Forest.

22. The pine reproduction weevil continues as a problem in pine plantations in local areas in the Central Sierras.

A list of specific problem areas where an action program is underway or contemplated is discussed below by insect species and area.

A. WESTERN PINE BEETLE AND PINE ENGRAVER

There are many areas in the State where these two insects are teaming up in outbreak proportions. Many of these more serious outbreaks have been triggered by blowdown, snow breakage, logging slash, and lightning.

1. Trout Creek Area - Siskiyou County

An aerial inspection by two company foresters of the Trout Creek area on McCloud River Lumber ownership showed the western pine beetle to be in outbreak proportions in this area, with estimates of over 1 million board feet of ponderosa pine currently infested on company lands alone. This is the heaviest infestation on company holdings. Most of the group loss was found around lightning trees.

Action.--A program of salvage of infested trees is underway to correct the situation.

2. Harris Mountain - Siskiyou County

The situation on the Harris Mountain area was reviewed from the air by the above McCloud foresters where they found a few small groups of ponderosa pine killed by the western pine beetle, but in general the area did not look too bad.

Action.--A program of sanitation-salvage is being considered for this area in 1961.

3. Burney Area - Shasta County

Higher-than-normal losses in ponderosa pine have been observed on the Fruit Growers Supply land in the Burney area which is under contract to the McCloud River Lumber Company. The McCloud Company has a continuing program of salvage of infested trees in the area which will result in the removal of about $2\frac{1}{2}$ million board feet of insect-infested and killed timber this season.

Action.--Continue the program of intensive salvage of infested trees on private land in the Burney area.

4. Dolber-Bishop Creek - Mariposa County

Several large groups of infested ponderosa pine occur from Dolber Creek to Bishop Creek on U.S. Forest Service ownership on the Sierra National Forest, adjacent to the west boundary of Yosemite National Park in the Chinquipin-Wawona area.

Action.--Appraise and control if conditions warrant.

5. Bass Lake - Madera County

Very heavy group losses in ponderosa pines is occurring in the Bass Lake maintenance control zone. A recent inspection shows about one thousand faded ponderosa pines in this area.

Action.--Control action is planned in the area during the coming winter.

6. Lassen National Forest

The recent fall aerial survey indicated that there had been a spectacular increase in insect-caused loss over a portion of the Lassen National Forest. The heaviest increases were noted in the lower Gooch Valley, south of Lava Peak, Blacks Mountain, Beaver Springs, south and east of Summit Lake, along the Hat Creek Rim from the Hat Creek Lookout to Baker Lake, on Red Rock Hill and south of Rocky Ledge Buttes, and on the west side of Highway 89 from Wilcox to Dugden Butte. Much of the early summer loss was associated with lightning-struck pines.

Action.--Appraise to determine a course of action.

7. Julian - San Diego County

This long-standing epidemic is continuing and has spread to new areas this year. Land west of North Peak is now infested, and the epidemic is encroaching upon the Cuyamaca Rancho State Park in the Middle Peak area.

Action.--Some control considered by the State on park land. Otherwise no control planned due to the lack of a cooperative control agreement.

8. Cuyamaca Rancho State Park - San Diego County

In addition to the infestation at Middle Peak (reported above), two or three groups of infested trees were detected and treated. This was an increase in western pine beetle activity over recent years.

Action.--Continue maintenance control.

9. Lost Valley - San Diego County

The epidemic is continuing in Coulter pine in this area although there appears to be some decrease this year. A recent aerial check showed many recent group kills throughout the valley, but the groups are not as large as those last year.

Action.--No definite plan has yet been formulated.

10. Laguna Mountains - San Diego County

Early this spring one large group of Coulter pine trees infested with the western pine beetle was detected and treated. This was the first significant infestation of this insect detected in that area for a number of years.

Action.--Very good control accomplished this spring and no additional infested trees found since that time.

11. Palomar Mountain - San Diego County

An outbreak has developed in Coulter pine stands in the Agua Tibia Wilderness area. Single trees and about six groups of five to thirty trees each have been killed this year. In addition, a concentration of faded trees south of the observatory has just recently been detected.

Action.--At Agua Tibia, no definite course of action has been planned since it is in a Wilderness area. The recently detected problem south of the observatory will be checked on the ground in the near future.

12. May Valley - Riverside County

High losses in this area have increased to epidemic proportions in recent months in Coulter pine.

Action.-- Appraise and undertake control if conditions warrant. Control work has been withheld up to this time because of the lower values at stake.

13. San Jacinto - Riverside County

Faded trees on most of the San Jacinto District, outside of the wild area, were spotted by helicopter on August 31. A total of 1,339 trees were found. In a similar aerial spotting job late in June, 879 faded trees were found. Thus the number of faded trees increased by 460 in about a two-month period. During this period the control crew of from three to four men treated about 140 infested trees. From this it would appear that maintenance control is falling far behind its objective of treating the infested trees as rapidly as they show up. This count included 342 faded trees in May Valley which is outside the present maintenance control zone. Elimination of these from consideration would leave about 1,000 faded trees within the control area where the program calls for keeping the insect problem to the lowest possible level.

Action.--Speed up control action commensurate with the needs.

14. Lake Arrowhead - San Bernardino National Forest

Endemic losses continue in Coulter and ponderosa pine stands. Maintenance control efforts have successfully kept pace with the current fades and have maintained loss at a low constant level.

Action.--Continue with maintenance control and continue the sanitation-salvage sales now in progress and planned for the near future.

15. Camp Angeles & Barton Flats - San Bernardino National Forest

Tree mortality from attacks of the western pine beetle continue, but at a low level.

Action.--Continue maintenance control and proceed with sanitation-salvage treatment of adjacent areas.

16. Charleton, Chilao and Mt. Pacifico - Angeles National Forest

Endemic losses are continuing at Charleton and Chilao, and the heavier losses around the Pacifico Burn have subsided.

Action.--Continue maintenance control work and proceed with the sanitation-salvage treatment of adjacent areas.

17. Crystal Lake - Angeles National Forest

Some increased western pine beetle activity occurred during the year, and control efforts were stepped up to prevent a serious outbreak.

Action.--Continue maintenance control.

18. Figueroa Mountain Control Unit - Santa Barbara County

This area suffered a buildup of western pine beetle activity in ponderosa and Coulter pine, and control efforts were increased to prevent an epidemic outbreak. Losses have now returned to a moderate level.

Action.--Continue maintenance control.

19. Santa Rosa Mountain - Riverside County

Infestation reported last year has subsided and current losses are low.

Action.--Some sanitation-salvage logging planned in the near future on Indian Service land. Forest Service land may be treated later.

20. Alamo Mountain - Ventura County

Insect losses, including those from the western pine beetle, have been greatly reduced by sanitation-salvage treatment.

Action.--Provide maintenance control on a small portion of the sale area where high recreational values exist.

B. MOUNTAIN PINE AND WESTERN PINE BEETLE TOGETHER

There are several outbreak areas in the State where both the mountain pine beetle and the western pine beetle are teaming up to cause extensive loss, and since neither insect can be singled out as the major culprit both insects are considered together.

1. Chambers Creek Burn - Plumas County

An outbreak of the western pine beetle in ponderosa pine and the mountain pine beetle in sugar pine was appraised on September 30 on the Chambers Creek burn on the Plumas National Forest, where it was estimated that there were approximately 500 currently infested trees in an island of scorched pine in the middle of the burn.

Action.--Hold control in abeyance due to the extreme ruggedness of the country.

2. Battle Creek - Shasta County

An outbreak of the western pine beetle in ponderosa pine and the mountain pine beetle in sugar pine was detected in early summer on Diamond National Corporation land in the Battle Creek unit by company foresters. This outbreak apparently resulted from a buildup of these insects in lightning-struck trees.

Action.--The company initiated a fast program of salvage of infested trees, removing about $\frac{1}{2}$ million board feet which apparently solved the problem.

3. Beaver Creek - Tuolumne County

An outbreak of the western pine beetle and mountain pine beetle was detected by company foresters early in the summer on land in the Beaver Creek drainage owned by the Pickering Lumber Corporation.

Action.--A program of salvaging these infested trees has been undertaken by the company which appears to have held this infestation in check.

4. Eastern Shasta County

Ground examination plus several aerial inspections by Shasta Forest Company foresters, in eastern Shasta County, has shown losses in sugar pines and ponderosa pine increasing on company lands to the point that a control program is being initiated.

Action.--A program of salvage of infested trees is being considered for Shasta Forests Company land in eastern Shasta County.

5. Slate Creek - Tehama County

Very greatly accelerated loss in ponderosa and sugar pine exists in the Slate Creek drainage on Collins Pine Company holdings. Company foresters have determined that large numbers of insect-killed, lightning strikes from last year's severe summer storms bred up large populations of western pine beetle and mountain pine beetle broods. These high populations of beetles, coupled with the abnormally dry winter and spring just past, apparently set the stage for the current outbreak. Several hundred unmerchantable-sized trees have already been treated by the company with plans underway to salvage between 250- and 500-thousand board feet of merchantable pine.

Action.--A program of salvage of infested trees is planned for the near future.

6. McGee Burn - Fresno-Tulare Counties

A decided upward trend was recently noted in the number of top-killed and entire fades mostly in ponderosa pine, but some in sugar pine in the McGee burn and in adjacent unburned timber.

Action.--Continue to salvage log-infested trees.

7. Yosemite National Park

Activities of both these insects and, in particular, mountain pine beetle work in sugar pine, in the mixed conifer type in Yosemite National Park, are at the highest level for many years. Particularly heavy loss in sugar pine is occurring in a radius of about two miles around Crane Flat. Scattered sugar pine loss and groups of ponderosa pine fades occur in the Wawona area north along the Park boundary and on either side of the highway.

Action.--The Park Service has started their spotting of these areas, with control planned during the coming winter.

8. Mather-Crane Creek - Tuolumne-Mariposa County

Heavy, scattered sugar and ponderosa pine losses were observed in the fall aerial survey in the Mather, Anderson Meadow area and south of Crane Flat on the Stanislaus National Forest adjacent to the west boundary of the Yosemite National Park.

Action.--Appraise and institute control action if conditions warrant.

9. Sierra National Forest

One of the most serious outbreaks in recent years in both ponderosa and sugar pine is concentrated in the zone from about 4,000 to 6,000 feet

in elevation on the Sierra National Forest. Indications are that most of these outbreaks were triggered by an abundance of snowbreak material from late spring storms this year. Some of the more serious outbreak areas include the Lewis Creek basin, the Cedarbrook-Hugh Ryan area, the Cascadel Basin, and the Chiquito Basin, in addition to the Bass Lake area which is primarily a ponderosa pine problem.

Action.--Control action is planned.

c(1) MOUNTAIN PINE BEETLES IN SUGAR PINE

Losses in sugar pine caused by the mountain pine beetle to date are by far the heaviest in many years. Some of these outbreaks apparently were triggered by this insect building up in lightning-struck trees, but in other areas no unusual contributing factor was observed.

1. Calaveras County

The mountain pine beetle in sugar pine is in outbreak proportions on about 60,000 acres of Calaveras Land and Timber Corporation land in Calaveras County. Loss is occurring in all age classes and are found singly and in groups up to 7 trees, averaging an estimated 1 tree killed for every 160 acres. Company forester states, "This is by far the worst infestation I have ever seen in the 13 years I have been with the Calaveras Land and Timber Corporation, and more kill is showing up daily."

Action.--The company is attempting to salvage these trees whenever possible.

2. Strawberry Valley-Yuba County

A rather severe infestation of the mountain pine beetle in sugar pine has been underway since late spring in the Strawberry Valley area on Soper-Wheeler Company land. The company's sustained program of salvage has been underway throughout the summer.

Action.--Program of salvage of infested trees has apparently solved the problem for this year.

3. Forest Creek - Amador County

Somewhat above-normal loss in sugar pine on Winton Lumber Company land was noted by company foresters in three aerial inspections of company land in Calaveras, Amador, and El Dorado Counties, with heaviest concentrations noted in the Forest Creek drainage. Spotting of infested trees from the air aided in the salvage of about 1 million board feet of infested material during the season.

Action.--Continue a program of salvage of infested trees whenever they show up.

C(2) MOUNTAIN PINE BEETLE IN LODGEPOLE

1. Yosemite National Park

The mountain pine beetle continues to increase in lodgepole pine in the Dingley and Delaney Creek drainages in Yosemite National Park in spite of control action. A recent appraisal shows an estimated 1,300 infested trees in Delaney Creek. This is about a twofold increase over the number in the same area about one year ago. This infestation is gradually creeping toward Tuolumne Meadows, but so far control efforts in the Delaney area appear to have prevented the epidemic from reaching the Meadows.

Action.--Continue control in the Delaney area adjacent to the Tuolumne Meadows as a delaying action, hoping the combined efforts of control plus added tree vigor as the result of needleminer control will check the spread of this epidemic.

2. Lassen Volcanic National Park

Last year, for the first time in many years, several hundred lodgepole pines were found infested with the mountain pine beetle in the upper Hat Creek and Badger Flat areas on the Lassen Volcanic National Park. Control action was taken last year which held this infestation in check, but further evidence of activity was recently observed.

Action.--Continue control action in the Hat Creek and Badger Flat areas.

3. Silver Lake - Amador County

A recent appraisal survey of a mountain pine beetle infestation in lodgepole pine in the Silver Lake recreational area on the Plumas National Forest, showed about 200 currently infested trees on about one-hundred acres. It appeared that this infestation increased very suddenly last fall as the result of a buildup in a small area of lodgepole flooded by a beaver dam.

Action.--This area is being spotted and control action is planned this winter.

4. Military Road - Siskiyou County

Several thousand acres of lodgepole pine killing was recently observed from the fall aerial survey along the Military Pass Road east of Mt. Shasta in Siskiyou County.

Action.--Examine on ground to determine cause of killing.

5. Skunk Cabbage Creek - Modoc County

An epidemic infestation of the mountain pine beetle in lodgepole pine was reported and appraised three years ago in the Skunk Cabbage

drainage in the South Warner Mountains on the Modoc National Forest. Control was suggested for the area following the appraisal but the Forest decided against action after balancing the value at stake against the high cost of control. This infestation still continues at a high level. A new access road has been built to within a few miles of the infested area, and there may be some possibility of salvaging some of the infested trees.

Action.--Reevaluate the possibility of control through a salvage of infested trees.

6. Reds Meadow - Madera County

The high-use campground area at Reds Meadow on the Inyo National Forest has been on a maintenance control basis for the mountain pine beetle in lodgepole pine for many years, which appears to have kept the infestation at a very low level.

Action.--Continue the program of maintenance control.

7. Hobart Mills - Nevada County

A local outbreak of the mountain pine beetle in lodgepole pine near Hobart Mills on the Tahoe National Forest has recently been reported where groups of from 30 to 50 infested trees are common over a limited area.

Action.--Groundcheck of the area.

c(3) MOUNTAIN PINE BEETLE IN PONDEROSA PINE

The mountain pine beetle in ponderosa pine was discovered in outbreak proportions in the Warner Mountains on the Modoc National Forest in the spring aerial survey. Some of the more important of these are:

1. Joseph Creek Basin - Modoc County

This insect is in outbreak in dense stands of pole-sized ponderosa pine on about 1,000 acres on national-forest land. The infestation which was detected last spring is continuing at a high level with an estimated 1,000 trees currently infested.

Action.--Keep under surveillance.

2. Bidwell Creek - Mill Creek - Modoc County

Just south of the junction of Bidwell and Mill Creek there is another similar mountain pine beetle infestation where it is estimated that there are about 1,000 infested trees on about 100 acres. Most of the infestation is on private land.

Action.--Appraise if conditions warrant.

3. Fort Bidwell Indian Reservation - Modoc County

The recent fall survey showed new and expanding group loss in ponderosa pine on the Fort Bidwell Indian Reservation. It has not been possible to groundcheck this area yet.

Action.--Appraise.

D. JEFFREY PINE BEETLE

Losses in Jeffrey pine caused by Jeffrey pine beetle shows evidence of increases in many parts of the State.

1. Cannell Meadows - Tulare County

An appraisal of the Cannell Meadows Working Circle on the Sequoia National Forest in early May showed the Jeffrey pine beetle to be in outbreak proportions on about 100,000 acres. It was estimated that about 20 million board feet of Jeffrey pine was currently attacked at the time of the survey.

Action.--A sanitation-salvage operation was initiated in the early summer in the Salmon Creek area of the Cannell Meadows Working Circle. Similar treatment should be considered for the balance of the Working Circle.

2. Hessian Meadows - Tulare County

Two detection reports have been received of an outbreak of the Jeffrey pine beetle on about 9,000 acres in the Hessian Meadows area on the Inyo National Forest, on the Kern Plateau north of the Cannell Meadows Working Circle. This area has also been recently observed from the air.

Action.--Appraise.

3. Gold Lake - Sierra County

An appraisal on July 10 showed the Jeffrey pine beetle to be in outbreak on about 2,000 acres in the high-use area around Gold Lake.

Action.--A sanitation-salvage cutting operation which should solve this problem is being planned for the area.

4. Summit Lake - Shasta County

A very decided increase in Jeffrey pine beetle activity was groundchecked on the Hat Creek District of the Lassen National Forest near Summit Lake.

Action.--Control by salvage of infested trees before the current brood emerges.

5. Lassen Volcanic National Park

Jeffrey pine losses have increased throughout the Park, /probably influenced by the presence of numerous lightning-struck trees.

Action.--Continue maintenance control in the area.

6. Lake Arrowhead - San Bernardino County

Jeffrey pine beetle has been aggressive and accounted for most of the losses in Jeffrey pine in this area.

Action.--Continue maintenance control and sanitation-salvage treatment.

7. Camp Angeles & Barton Flats - San Bernardino National Forest

The Jeffrey pine beetle was the most important insect active in the area this year.

Action.--Continue maintenance control and sanitation-salvage treatment.

8. Big Bear- San Bernardino County

Jeffrey pine beetle was quite active and caused most of the tree mortality in the area. The problem was aggravated by numerous lightning strikes in part of the Holcomb Creek Sale.

Action.--Continue control by salvage-logging where possible, supplemented by fell-spray treatment on high-value Forest Service lands. No cooperative agreement is in effect to provide protection of private lands.

9. Big Pines, Angeles Crest - Los Angeles County

A small number of infested trees found in an area where this insect had previously been absent or undetected.

Action.--Sanitation-salvage treatment planned in the near future.

10. Crystal Lake - Los Angeles County

Some Jeffrey pine beetle activity present and contributing to the overall endemic losses in the area.

Action.--Continue maintenance control.

E. PINE ENGRAVERS (IPS)

Damage from pine engravers has greatly increased statewide, and indications are that this may be one of the highest loss-years on record.

Pine engravers were associated with practically all of the important outbreaks of the western pine beetle in ponderosa pine and Coulter pine and, to a lesser degree, the mountain pine beetle in sugar pine. Many trees now only top-killed by the engraver will subsequently fill in with the western pine beetle if in ponderosa pine, or the mountain pine beetle if in sugar pine. Some areas where the engraver has been particularly destructive include the Hat Creek District on the Lassen National Forest in Shasta County, the Slate Creek Drainage in Tehama County, the Rockerby area in Yuba County, the Dark Canyon area in Sierra County, the Sierra National Forest, particularly Bass Lake, in Madera County, the McGee burn in Fresno and Tulare County, and a general heavy buildup in the foothill country from Shasta County on the north to Tulare County on the south, except that there is only minor damage at this time in the Grass Valley-Nevada City area where damage was so heavy several years ago.

In some areas in southern California the pine engravers are completely killing Coulter pine without any association with other insects. Some of these areas include.

1. Indian Canyon - Orange County

An epidemic in Coulter pine has killed two groups of about 50 trees each, plus some smaller groups and scattered individual trees during the year. The larger trees often were killed in stages, and many were attacked by the red turpentine beetle after being nearly destroyed by the engravers.

Action.--Due to the high expense of direct control work in this low-value area of difficult terrain, no activity has been taken up to the present time.

2. Corte Madera - San Diego County

Despite control efforts, an outbreak has developed in Coulter pine in this control area. In September there were 85-100 infested trees present, in addition to those which had been treated earlier in the year. The infestation has progressed from top kill to complete killing during the summer and fall, and some trees are invaded by the red turpentine beetle in the last stages.

Action.--Continue control efforts and use lindane sprays to increase effectiveness.

3. Big Bear - San Bernardino County

Two groups (8-15 trees) of Jeffrey pine and some scattered

individuals were completely killed in an area where sanitation-salvage logging had been done in the late fall and early spring.

Action.--The larger trees were salvaged while partially infested and the smaller ones treated. Despite the recommended slash disposal action, some damage can result in logging areas in southern California.

4. San Jacinto - Riverside County

Within the western pine beetle outbreak area of Coulter pine, numerous trees are being attacked and killed by pine engravers without the aid of the western pine beetle.

Action.--Spot and treat engraver-infested trees along with those infested by the western pine beetle.

F. CALIFORNIA FLATHEADED BORER

Serious damage by the California flatheaded borer is largely confined to southern California where its attack on Jeffrey pine constitutes the major control problem in this area. Damage from this insect showed a marked decrease in 1958, and present indications are that this low level is continuing this season.

1. Laguna Mountain - San Diego County

The infestation of this insect decreased during the year and the losses are currently at a low level.

Action.--Continue maintenance control and expand the area under protection.

2. San Jacinto - Riverside County

California flatheaded borer activity at a low level during most of the year. Recently some increase noted in an area where control has not been applied (May Valley).

Action.--Continue maintenance control.

3. Mill Potrero - Kern County

Infestation declined this year to a high endemic level.

Action.--Continue maintenance control and proceed with the sanitation-salvage treatment planned for the area.

4. Frazier Mountain - Ventura County

Only moderate losses occurring so far this year.

Action.--Continue maintenance control in high-value areas.

5. Alemo Mountain - Ventura County

Sanitation-salvage treatment reduced insect loss, including those from the California flatheaded borer, to a low level.

Action.--Provide maintenance control on a small portion of the sale area where high recreational values exist.

6. Wrightwood - San Bernardino County

Some decline in the California flatheaded borer infestation occurred but losses are still excessive.

Action.--Begin initial maintenance control work this coming winter and spring.

7. Big Pines, Angeles Crest - Los Angeles County

Low endemic losses on the areas treated by sanitation-salvage logging with higher losses in the untreated areas.

Action.--Continue maintenance control by means of salvage logging and fell-spray treatment on high-value portions of the Big Pines sale. Proceed with the sanitation-salvage treatment planned for the Angeles Crest (Winston Springs Sale).

G. THE FIR ENGRAVER

Losses in white and red fir caused by the fir engraver are somewhat spotty, with some local areas reported as having very heavy loss. The general statewide picture indicates heavier loss than last year.

1. Trout Creek - Tulare County

Very heavy loss has been reported to white and red fir in the upper Trout Creek drainage which is presumed to be caused by the fir engraver. This area has also been recently examined from the air, but a good appraisal has not yet been possible.

Action.--Appraise.

2. Casa Vieja Meadows - Tulare County

A similar situation was reported from the Casa Vieja Meadows area on the Mt. Whitney District of the Inyo National Forest. This area also has been recently checked from the air.

Action.--Appraise.

3. Bear Valley - Placer County

A very heavy local epidemic of the fir engraver in white fir was appraised in early August, near Bear Valley on PG&E ownership, where it was estimated that several thousand white firs had been killed by the overwintering generation. No current attack was found at the time of the inspection, but it is presumed that this outbreak will continue this season.

Action.--Keep this area under close surveillance to detect any indication of continuing activity.

H. LODGEPOLE NEEDLEMINER

The lodgepole needleminer continues at a high epidemic level on about 60,000 acres in Yosemite National Park and on about 1,300 acres in the Sequoia-Kings Canyon National Park. The work of this insect was reported, but not confirmed, in the China Peak area on the Sierra National Forest.

The Park Service, in cooperation with the PSW Station, conducted a control operation on about 3,400 acres of high recreational area in the Tenaya Lake-Tuolumne Meadows area, using 2 pounds of malathion in 20 gallons of diesel oil per acre applied by two Heller 12-E helicopters. The job was divided into 2 parts, with about 800 acres being sprayed in July at the height of the moth flight and the remainder sprayed in late August to kill the new larvae as they emerged from the eggs. The moth spray gave an average of 91 percent control and the larval spray 73 percent control.

Action.--Carry on screening tests with additional promising insecticides in an attempt to improve control results.

I. DOUGLAS-FIR BEETLES

Losses in Douglas-fir caused by the Douglas-fir beetle remain at a relatively low level throughout most of northwestern California. The Grider Creek outbreak in Siskiyou of last season has subsided to a low level.

1. Bald Hills - Humboldt County

A potential problem exists in the Bald Hills area east of Orick where heavy broods of the Douglas-fir beetle are building up in windthrown Douglas-fir.

Action.--Salvage of the infested blowdown trees is underway.

2. Taylor Creek Burn - Siskiyou County

Several thousand infested Douglas-firs were observed from the air on, and adjacent to, the 1955 Taylor Creek burn on the Salmon River District of the Klamath National F. No ground examination of the area has been made so far, but it is possible that the Douglas-fir beetle is responsible for the damage.

Action.--Make an appraisal of the area as soon as possible.

3. Lost Creek - Plumas County

More than normal Douglas-fir beetle activity was reported on Soper-Wheeler Company's holdings in Plumas County, with one severe outbreak in the Lost Creek area. This is the first indication the Station has of increased activity by this insect in the North Central Sierra area.

Action.--Keep the area under close surveillance to check on the progress of this infestation.

J. DOUGLAS-FIR ENGRAVER

Late last winter and early this spring numerous detection reports were received of Douglas-fir engraver outbreaks in Sonoma, Mendocino, and Humboldt Counties, with the heaviest concentration around Garberville and Miranda. There are some indications that some of these outbreaks are continuing, but the magnitude of the problem will not be apparent until the currently infested trees start to fade.

Action.--Keep these areas under surveillance.

K. PINE REPRODUCTION WEEVIL

This weevil continues to cause serious damage to young plantings of ponderosa and Jeffrey pine in the Central Sierra area. Two plantations on the Stanislaus National Forest, totaling 2,000 acres, were sprayed with DDT solution at the rate of 1 pound of DDT in 1 gallon of diesel oil per acre late in May. The spray was applied by fixed-wing aircraft, except adjacent to major stream courses where the spray was applied by hand. Two smaller plantations on the Eldorado National Forest, totaling about 40 acres, were sprayed by hand in early June.

Action.--Make a post-control appraisal to determine effectiveness of control.

L. THE GREAT BASIN TENT CATERPILLAR

Defoliation of browse plants by the Great Basin tent caterpillar was considerably reduced in most outbreak areas of the previous season between Westwood and Chester on the Lassen National Forest, in the Truckee area on the Tahoe National Forest, and around Mammoth on the Inyo National Forest. The infestation near the Conway Summit on the Toiyabe National Forest increased considerably, with several hundred acres of bitterbrush completely stripped this season.

Action.--Keep these areas under surveillance for further development.

M. PANDORA MOTH

Numerous adults of this potentially destructive defoliator were reported from the Laguna Mountain and the Cuyamaca Rancho State Park in San Diego County in late July. Also some egg masses were found on pine trees at Laguna. However, no evidence of defoliation was observed in either area.

Action.--Check these areas for evidence of defoliation next spring.

N. THE BLACK PINE-LEAF SCALE

Further evidence was accumulated this season on the importance of this insect in causing crown decadence in sugar pine. Six new centers of infestation were reported where the insect was causing serious crown damage in sugar pine, from several hundred to several thousand acres in each outbreak area. These new centers include Mill Creek on the Mendocino National Forest, Thompson Peak and Big Bar on the Shasta Trinity National Forest, Hatchet Mountain in Shasta County, Hells Half Acre on the Stanislaus National Forest, and Soap Creek Gap in Tuolumne County. The latter two represent areas of such heavy damage that the land managers have already taken steps to salvage many of the more heavily infested trees. The Station has established a series of 19 sample trees in the Soap Creek gap area which have been photographed and classified as to crown deterioration. Periodic observations will be made on this series of trees to determine their rate of recovery or decline.

Action.--Further observations to determine the importance of the insect in sugar pine decadence.

O. SPRUCE BUDWORM

The spruce budworm in California is limited to the Warner Mountains on the Modoc National Forest, and has persisted in this area for many years without causing any serious damage. Last year there was a noticeable increase in defoliation in the North Warners and for the first time defoliation was found in the South Warners.

This year there was very heavy defoliation on about 1,800 acres of white fir, from Larry Flat south for one mile along Bidwell Creek in the North Warners. About 1,000 acres on Horse Mountain in the South Warners were similarly defoliated. Most of the current year's needles were destroyed and quite a bit of bud damage was evident. From past records it appears that the damage this season is the heaviest on record.

Action.--Keep under surveillance.

Table of Current Insect Infestations Requiring Action

Project Area	Location	Insect Species ^{1/}	Host ^{2/}	Recommended Action*
<u>NORTHERN CALIFORNIA</u>				
<u>Areas Requiring Initial Action</u>				
Trout Creek	Siskiyou	Db-Ips	PP	Salvage of infested trees
Burney Area	Shasta Co.	Db-Ips-Im	PP-JP	do.
Dolber-Bishop Cr.	Mariposa Co.	Db-Ips	PP	Appraisal
Lassen N.F.	Shasta-Lassen Co.	Db-Ips-Dj-Dm	PP-SP-JP	do.
Chambers Creek Burn	Plumas Co.	Db-Ips-Dm	PP-SP	Control held in abeyance
Battle Creek	Shasta Co.	Db-Ips-Im	PP-SP	Salvage of infested trees
Beaver Creek	Tuolumne Co.	Db-Dm	PP-SP	do.
Eastern Shasta Co.	Shasta Co.	Db-Ips-Im	PP-SP	do.
Slate Creek	Tehama Co.	Db-Ips-Im	PP-SP	Salvage of infested trees plus control of unmerchantable infested trees.
Mather-Crane Cr.	Tuolumne and Mariposa Co.	Db-Ips-Im	PP-SP	Appraisal
Sierra N.F.		Db-Ips-Im	PP-SP	do.

1/ Db - Western pine beetle
 Im - Mountain pine beetle
 Dj - Jeffrey pine beetle
 Dp - Douglas-fir beetle
 Mc - California flatheaded borer
 Ips - Pine engraver beetle
 Pa - Pandora moth
 Rn - Lodgepole needle miner
 Rw - Reproduction weevil
 Sb - Spruce budworm
 Sv - Fir engraver

2/ LP - Lodgepole pine
 CP - Coulter pine
 JP - Jeffrey pine
 PP - Ponderosa pine
 SP - Sugar pine
 WF - White fir
 DF - Douglas-fir
 RF - Red fir

* Where maintenance control is recommended, the salvage of infested trees is advisable wherever it is possible. Also, where sanitation-salvage is recommended, maintenance control should be done on the portion of the area which has previously been covered by sanitation logging.

Table of Current Insect Infestations Requiring Action (continued)

Project Area	Location	Insect Species	Host	Recommended Action
Calaveras Co.	Calaveras Co.	Dm	SP	Salvage infested trees
Strawberry Valley	Yuba Co.	Dm	SP	do.
Forest Creek	Amador Co.	Dm	SP	do.
Silver Lake	Amador Co.	Dm	LP	Chemical treatment
Military Road	Siskiyou Co.	Dm	LP	Appraisal
Skunk Cabbage	Modoc Co.	Dm	LP	Reevaluate control
Hobart Mills	Nevada Co.	Dm	LP	Appraisal
Joseph Creek	Modoc Co.	Dm	PP	do.
Bidwell Creek	Modoc Co.	Dm	PP	Appraisal
Ft. Bidwell	Modoc Co.	Dm	PP	do.
Hessian Meadows	Tulare Co.	Dj	JP	do.
Gold Lake	Sierra Co.	Dj	JP	Sanitation-salvage
Summit Lake	Shasta Co.	Dj	JP	Salvage infested trees
Trout Creek	Tulare Co.	Sv	WF-RF	Appraisal
Casa Vieja	Tulare Co.	Sv	WF-RF	do.
Taylor Creek Burn	Siskiyou	Dp	DF	do.
Lost Creek	Plumas	Dp	DF	do.
Warner Mts.	Modoc	Sb	WF	do.

Areas Requiring Continued Action

Delaney Creek	Yosemite N.P.	Dm	LP	Chemical control
Deadman Creek	Inyo N.F.	Dj	JP	Maintenance control
Reds Meadow	Inyo N.F.	Dm	LP	do.
Tunnell Meadows	Inyo N.F.	Dm	LP	do.

Table of Current Insect Infestations Requiring Action (continued)

Project Area	Location	Insect Species	Host	Recommended Action
Bass Lake	Madera	Db-Ips	PP	do.
McGee Burn	Fresno-Tulare	Db-Ips-Dm	PP-SP	Continue salvage infested trees
Lassen N.P.		Db-Ips- Dm-Dj	PP-SP- LP-JP	Maintenance control
Yosemite N.P.		Db-Ips- Dm-Dj	JP-LP- PP-SP	do.
Sequoia-Kings Canyon N.P.		Db-Ips- Dm-Dj	SP-PP- JP	do.

SOUTHERN CALIFORNIA

Areas Requiring Initial Action

Wrightwood	San Bernardino Co.	Mc	JP	Initiate maintenance control
Winsor Springs	Los Angeles	Mc-Dj	JP	Initiate sanitation-salvage
May Valley	Riverside Co.	Db-Ips Mc	CP JP	Appraisal
Laguna Mt.	San Diego Co.	Pm	JP	do.

Areas Requiring Continued Action

San Jacinto	San Bernardino N.F.	Db-Mc	JP-PP- CP	Year-round maintenance control
Barton Flats	San Bernardino N.F.	Db-Dj	PP-JP	do.
Corte Madera	Cleveland N.F.	Db-Mc	JP-PP- CP	Maintenance control
Cuyamaca Rancho State Park	Cleveland N.F.	Db-Mc Dm	JP-PP- CP-SP	do.
Alamo Mt.	Los Padres N.F.	Db-Mc Dm	PP-JP SP	do.

Table of Current Insect Infestations Requiring Action(continued)

Project Area	Location	Insect Species	Host	Recommended Action
Figueroa Mt.	Los Padres N.F.	Db	PP-CP	Maintenance control
Grade Valley	Los Padres N.F.	Mc	JP	do.
Charlton-Chilao & Barton Flats	Angeles N.F.	Db	PP-CP	do.
Crystal Lake	Angeles N.F.	Db-Dj	PP-JP	do.
Big Pines-Wrightwood	Angeles N.F.	Mc-Ips	JP	do.
Arrowhead-Crestline	San Bernardino N.F.	Dm-Db- Dj	JP-PP- CP	Year-round maintenance control
Laguna	Cleveland N.F.	Mc-Db	JP-CP	Maintenance control